CONFIDENTIAL

Files, RS-6

26 February 1954

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REFERENCE: Contract PSC-148-UNV

1. Purpose of trip:

a. To discuss the means to be taken to reduce HFO radiation and oscillator pulling in both the RR-6 and the RR-6A.

b. To evaluate whatever steps had been taken at the contractor's plant to correct the above faults on the production line.

c. To evaluate the method of test used in connection with the measurement of HFO radiation.

d. To discuss any production problems with the contractor and the Navy Inspector.

2. On arrival at the plant we were met by the Navy Inspector and were escorted to the RS-6 production line. The following observations were noted:

a. The critical oscillator lead was not being dressed out of the RF compartment.

b. It was found that the 1% and the 5% tests (this includes the HFO radiation test) had been waived by the Government.

c. The Navy Inspectors had two complaints found in an average of one unit out of twenty. These were: low audio output of crystal calibration beats and attenuation of received signals on break-in operation.

3. Regarding the RS-6A, the contractor exhibited the steps he has taken to correct oscillator pulling and HFO radiation. These include the recommendations of the Government and additional isolation of the variable bias line. Steps had not been taken to correct the trouble in the RS-6. The improvements in both the above cases were explained in terms of the magnitude of the oscillator pull rather than in terms of oscillator radiation.

4. An investigation of the test used to measure oscillator radiation at the contractor's plant shows that the method is not adequate for measuring the radiation properties of a "Front End" deluged with oscillator voltage. The present method apparently effectively measures case radiation. The early RS-6 #2003 and the corrected units show that this is true. Even with a 27' antenna directly over the Stoddart loop, a corrected unit will not indicate antenna radiation above case radiation. The only reasonable method is to measure the oscillator directly on the receiver antenna terminals and to isolate the measuring instrument (receiver) from the case induction field. The method must be standard. The use of a Stoddart unit in a field check will be helpful.

5. As the amount of oscillator voltage found on the RF grid is directly proportional to the oscillator pulling, a shift of not more than 3 kc will be allowed temporarily, as a measure of oscillator radiation. This is good insurance, but is not a guarantee that the radiation is within limits. It is felt that a direct method of measurement is required. We propose taking the following steps:

a. We are sending the contractor a previously submitted prototype of the RR-6A for modifications to reduce HFO radiation and oscillator pulling.

b. After he has modified this unit in accordance with our recommendations and his further study, measurements will be taken here on the returned unit as per paragraph (d) below.

c. Institute a simple 100% factory comparison check, using the Stoddart if possible, to show that antenna radiation does not exceed case radiation.

d. We request that the 1% and 5% checks be performed by the contractor. For oscillator radiation tests we recommend the application of MIL-16410 and Amendment #2 (Fig. 39). It would be well to have the contractor set up for the above checks and have one of our people witness measurements on at least ten units from which a production limit in microwatts on the receiver primary antenna coils can be set. The oscillator pull should not be greater than 2 kc.

e. Institute a study at the laboratory to measure radiation in the field in order to study the effect of antenna radiation, case radiation, and HFO radiation of present agent equipment. Evaluate ease of DF.

6. The following items were mentioned by the Navy Inspectors as sources of trouble found in about one in twenty units:

a. The crystal calibration beats do not come through with sufficient audio power at the high end of the high band. [redacted] suggests by-passing the audio stage cathode resistor with a .001 uf condenser. This was found to be the solution for obtaining higher calibration oscillator output on the RS-6A. 25X1

b. There is an abnormal attenuation of signal fed through the transmitter relay on break-in operation in the receive position. The Navy Inspector will bring these units to the attention of [redacted] for evaluation. 25X1

c. The die cast receiver cases are coming in from the subcontractor with a small surface crack on the base casting just over the opening for the power plug stowage area. It was suggested to the Navy that these cases be rejected before the receiver is assembled, and that the subcontractor be further consulted and, if necessary, grind down the die in this area to build up the corner wall thickness.

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